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CP violation tests in hyperon decays at BESIII

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The hyperons are produced with a non-zero spin polarization that is straight-forward to parameterize in processes involving virtual photons or vector mesons, enable direct and precise CP violation tests. These CP tests can be performed on e.g. $J/\psi, \psi' \rightarrow \Lambda \bar{\Lambda}, \Xi \bar{\Xi}$ and $\Sigma \bar{\Sigma}$. For the cascade hyperon decay the exclusive measurement of the final state particles allows for three independent CP-symmetry tests and the determination of the strong and weak phase differences. Thanks to the world's largest data samples at the J/ψ and ψ' resonances collected at the BESIII experiment, the multi-dimensional analyses making use of polarization and entanglement have been performed for these processes.

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